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In the Claims

1-14. (cancelled)

15. (previously presented) A process for ignition of combustion of fuel in a combustion space of an engine, comprising the steps of:

conveying fuel into the combustion space;

producing microwave energy in a microwave source located outside the combustion space;

injecting the microwave radiation into and uniformly throughout the combustion space with fuel therein in at least one microwave pulse of short duration and of high energy;

preventing formation of plasma by selection of a time interval for injecting of the microwave radiation, of power of the microwave radiation, of pulse duration and of pulse spacing;

absorbing the microwave pulse by the fuel distributed into the combustion space; and

igniting the fuel uniformly over a large space in the combustion space by energy delivered into the fuel due to absorption of the microwave pulse essentially at the same time.

16. (previously presented) A process according to claim 15 wherein

at least one of a number of spaced microwave pulses, power of the microwave pulses, pulse duration and pulse timing is controlled depending on engine operating states and power demands on the engine.

17. (previously presented) A process according to claim 15 wherein the microwave radiation is injected in 1 to 10 spaced microwave pulses.

18. (previously presented) A process according to claim 17 wherein the microwave radiation is injected in 1 to 5 spaced microwave pulses.

19. (previously presented) A process according to claim 15 wherein said microwave pulse has a power between 1 kW and 70 kW.

20. (previously presented) A process according to claim 15 wherein the microwave pulse has a duration between 1 ns and 2 ms.

21. (previously presented) A process according to claim 17 wherein the microwave pulses are spaced between 100 ns and 2 ms.

22. (previously presented) A process according to claim 15 wherein the microwave radiation is injected in 1 to 10 spaced microwave pulses; each microwave pulse has a power between 1 kW and 70 kW; and each microwave pulse has a duration between 1 ns and 2 ms.

23. (previously presented) A process according to claim 22 wherein the microwave radiation is injected in 1 to 5 spaced microwave pulses.

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24. (previously presented) A process according to claim 15 wherein the microwave radiation is injected in several spaced microwave pulses of at least one of different power and different pulse duration for leveling temperature increases of the fuel in the combustion space up to an ignition temperature by gradual delivery of energy.

25. (cancelled)

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (cancelled)

30. (cancelled)

31. (cancelled)

32. (cancelled)

33. (cancelled)

34. (cancelled)

35. (previously presented) A process according to claim 15 wherein the microwave radiation is injected into the combustion space in spaced microwave pulses.